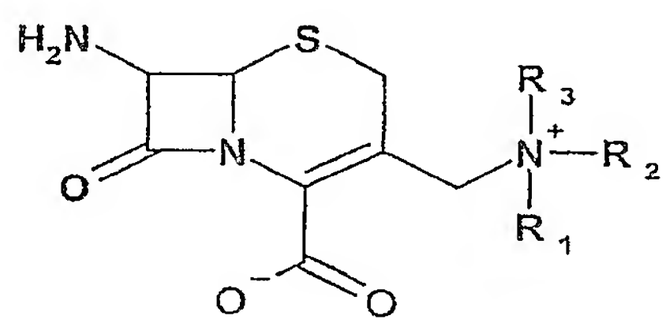
Amended claims

What we claim is

1. Process for the production of a compound of formula



I

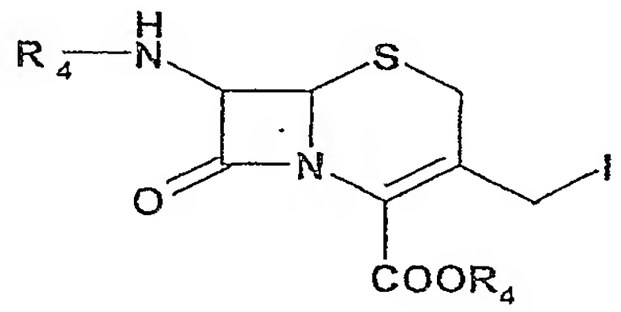
wherein R_1, R_2 and R_3 , independently of one another, are alkyl, alkenyl, aryl, hydroxy(C_{1-6})alkyl, carbamoyl-(C_{1-6})alkyl, amino-(C_{1-6})alkyl, acylamino-(C_{1-6})alkyl or carboxy-(C_{1-6})alkyl , or wherein

R_2 and R_3 together with the adjacent nitrogen atom, form an alicyclic 5- to 8-membered heterocyclic ring, which, in addition to the nitrogen atom, may also contain a further 1 or 2 hetero atoms selected from the group consisting of oxygen and sulphur, and R_1 signifies alkyl, alkenyl or aryl,

as well as for the production of acid addition salts and/or hydrates of a compound of formula I,

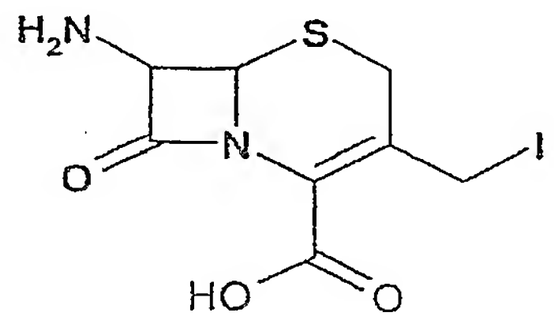
comprising the reaction steps

a) desilylation of a compound of formula



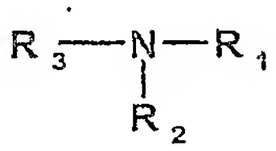
II

wherein R_4 is a silyl-protecting group, by adding a protic solvent, in order to obtain a compound of formula



III

b) reaction of the compound of formula III obtained in step a) with an organic base of formula



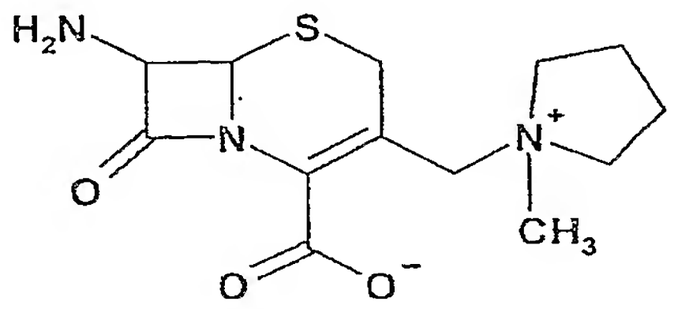
IV

wherein R_1, R_2 and R_3 have the significances indicated above, in order to obtain a compound of formula I, and

~~2. Process according to claim 1,~~ whereby steps a) and b) are carried out simultaneously in one reaction container.

2 ~~3~~. Process according to ~~one of~~ claim~~s~~ 1, ~~or 2~~ whereby R_1, R_2 and R_3 , independently of one another, are alkyl, alkenyl, aryl or hydroxy(C_{1-6})alkyl.

3 ~~4~~. Process according to ~~one of~~ claim~~s~~ 1 ~~or 2~~, whereby R_2 and R_3 together represent a C_4-alkylene group, and with the adjacent nitrogen atom, form a saturated 5-membered heterocycle, and R_1 represents a methyl group, so that a compound of formula



IA

is obtained.

4 ~~5~~. Process according to one of claims 1 to ~~4~~ 3, wherein the protic solvent is a (C_{1-4})-alcohol or a mixture of several (C_{1-4})-alcohols.

5 ~~6~~. Process according to claim ~~5~~ 4, wherein the alcohol is methanol, ethanol, isopropanol, n-propanol, 2-methyl-propan-2-ol, glycol, glycerol, a propanediol or a butanediol.

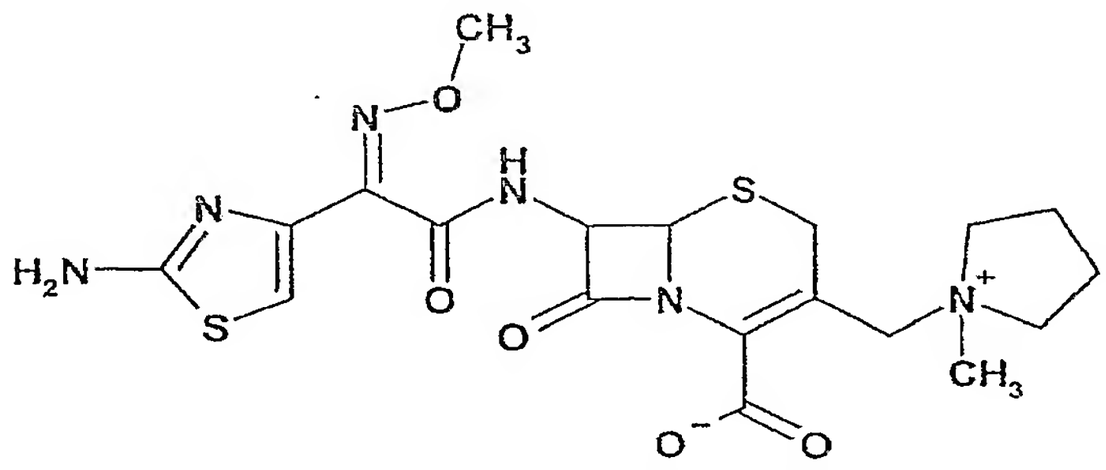
6 ~~7~~. Process according to claim ~~6~~ 3, whereby the alcohol is isopropanol or 1,2-butanediol.

7 8. Process according to one of the preceding claims, whereby a compound of formula I obtained from step b) is obtained in the form of an acid addition salt and/or hydrate or is converted into the same.

8 9. Process according to claim 7, whereby the acid addition salt is a hydriodide or a hydrochloride.

9 10. Process according to one of claims 7 to 8, whereby the hydrate is a monohydrate.

10 11. Process for the production of cefepime of formula

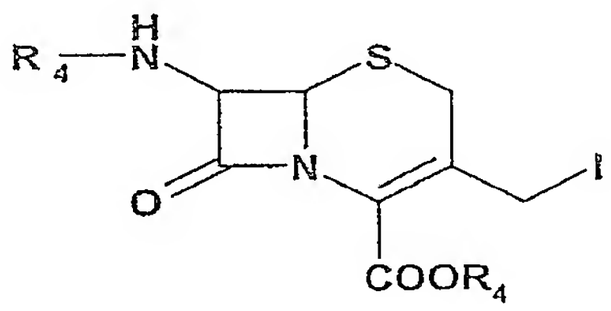


V

or one of its acid addition salts and/or its hydrates

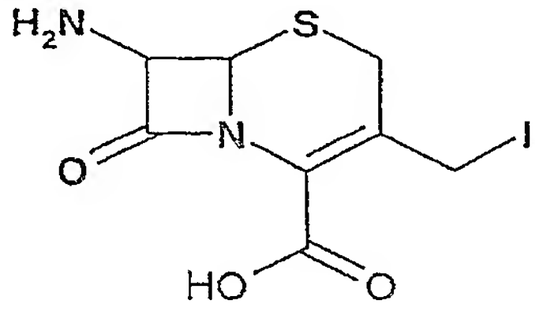
comprising the reaction steps

a) desilylation of a compound of formula



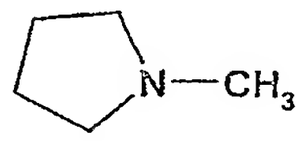
II

wherein R_4 is a silyl-protecting group, by adding a protic solvent, in order to obtain a compound of formula



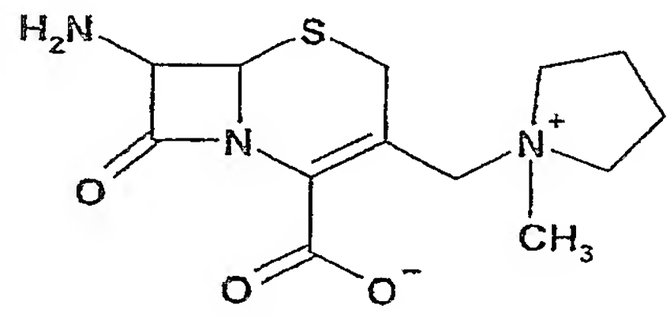
III

b) reaction of the compound of formula III obtained in step a) with a strong organic base of formula



IVA

in order to obtain a compound of formula



IA

c) optional conversion of a compound of formula IA, as obtained from step b), into the form of an acid addition salt and/or a hydrate, and

d) acylation of the 7-amino group of a compound of formula IA obtained from step b) or of its acid addition salt and/or hydrate obtained from step c), in order to obtain cefepime of formula V,

whereby steps a) and b) are carried out simultaneously in one reaction container.